Amendments to the Claims:

Please add new claims 74-90. This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-6. (Canceled)

7. (currently amended): A nucleic acid composition comprising:

a nucleic acid vector backbone comprising a nucleic acid sequence of SEQ ID NO:297, wherein nucleotides at positions 784, 1161, 1218, 1264, 1337, 1829, 1831, 1874, 1876, 1940, 1942, 1963, 1966, 1987, 1997 and 1999 are as follows:

G at nucleotides 784, 1161, 1218, 1831, 1876, 1942, 1966 and 1999;

A at nucleotides 1264, 1337, 1829, 1874, 1940 and 1997; and

T at nucleotides 1963 and 1987.

8-24. (Canceled)

25. (previously presented): The nucleic acid composition of claim 7, wherein the composition further comprises an immune inhibitory nucleic acid sequence (IIS) comprising a hexamer region of the formula 5'-Purine-Purine-[X]-[Y]-Pyrimidine-Pyrimidine-3'; wherein X and Y are any naturally occurring or synthetic nucleotides except that X and Y cannot be cytosine-guanine.

26. (previously presented): The nucleic acid composition of claim 25, wherein the IIS further comprises a polyG region linked 5' or 3' to the hexamer region.

27. (previously presented): The nucleic acid composition of claim 25, wherein the IIS further comprises a first polyG region linked 5' to the hexamer region and a second polyG region linked 3' to the hexamer region.

28. (previously presented): The nucleic acid composition of claim 7, wherein the nucleic acid vector composition further comprises an IIS comprising a hexamer region of the formula 5'-Purine-Pyrimidine-[X]-[Y]-Pyrimidine-Pyrimidine-3', wherein X and Y are any naturally occurring or synthetic nucleotides except that X and Y cannot be cytosine-guanine.

29. (previously presented): The nucleic acid composition of claim 28, wherein the IIS further comprises a polyG region linked 5' or 3' to the hexamer region.

30. (previously presented): The nucleic acid composition of claim 28, wherein the IIS further comprises a first polyG region linked 5' to the hexamer region and a second polyG region linked 3' to the hexamer region.

31. (previously presented): The nucleic acid composition of claim 25, wherein the nucleic acid vector further comprises the IIS.

32. (previously presented): The nucleic acid composition of claim 7, wherein the vector further comprises a polynucleotide encoding an autoantigen targeted in an autoimmune disease.

33. (previously presented): The nucleic acid composition of claim 32, wherein the autoantigen comprises a polynucleotide encoding a myelin protein.

34. (previously presented): The nucleic acid composition of claim 33, wherein the myelin protein is myelin basic protein (MBP).

35. (previously presented): The nucleic acid composition of claim 32, wherein the autoantigen comprises a polynucleotide encoding an insulin protein.

36. (previously presented): The nucleic acid composition of claim 35, wherein the insulin protein is selected from the group consisting of insulin, proinsulin and preproinsulin.

37. (previously presented): The nucleic acid composition of claim 7, further comprising a pharmaceutically acceptable carrier.

38. (previously presented): A composition comprising a modified nucleic acid vector with reduced immunostimulatory properties, the nucleic acid vector modified by a method comprising the steps of:

a) providing an unmodified nucleic acid vector comprising a CpG dinucleotide, wherein the CpG dinucleotide is in a motif of a formula 5' purine-pyrimidine-C-G-pyrimidine-pyrimidine-3';

b) substituting the cytosine in the CpG dinucleotide to a non-cytosine in the motif in the unmodified vector; thereby producing a modified nucleic acid vector, wherein the modified nucleic acid vector induces a reduced degree of immunostimulation in comparison to the unmodified nucleic acid vector.

39. (previously presented): The composition of claim 38, wherein the cytosine to non-cytosine substitution is cytosine to guanine.

40. (previously presented): The composition of claim 38, wherein a plurality of cytosine to non-cytosine substitutions are made.

41. (previously presented): The composition of claim 40, wherein the plurality of cytosine to non-cytosine substitutions are made outside of a control region of the modified vector.

42. (previously presented): The composition of claim 38, wherein the modified vector is a plasmid or cosmid vector.

43. (previously presented): The composition of claim 38, wherein the composition further comprises an IIS comprising a hexamer region of a formula selected from the group consisting of 5'-Purine-Purine-[X]-[Y]-Pyrimidine-Pyrimidine-3' and 5'-Purine-

Pyrimidine-[X]-[Y]-Pyrimidine-Pyrimidine-3'; wherein X and Y are any naturally occurring or synthetic nucleotides except that X and Y cannot be cytosine-guanine.

44. (previously presented): The composition of claim 43, wherein the nucleic acid vector further comprises the IIS.

45. (previously presented): The composition of claim 43, wherein the IIS further comprises a polyG region linked 5' or 3' to the hexamer region.

46. (previously presented): The composition of claim 43, wherein the IIS further comprises a first polyG region linked 5' to the hexamer region and a second polyG region linked 3' to the hexamer region.

47. (previously presented): The composition of claim 38, wherein the unmodified vector is SEQ ID NO:297.

48. (previously presented): The composition of claim 47, wherein the unmodified vector that is SEQ ID NO:297 is modified to comprise the following cytosine to non-cytosine substitutions:

C to G at nucleotides 784, 1161, 1218 and 1966;

C to A at nucleotides 1264, 1337, 1829, 1874, 1940, and 1997; and

C to T at nucleotides 1963 and 1987.

49. (previously presented): The composition of claim 48, wherein the unmodified vector that is SEQ ID NO:297 is further modified to comprise the following cytosine to non-cytosine substitutions: C to G at nucleotides 1831, 1876, 1942, and 1999.

50. (previously presented): The composition of claim 38, further comprising a pharmaceutically acceptable carrier.

51. (previously presented): The composition of claim 38, wherein the modified vector further comprises a polynucleotide encoding an autoantigen targeted in an autoimmune disease.

52. (previously presented): The composition of claim 51, further comprising a polynucleotide encoding a myelin protein.

53. (previously presented): The composition of claim 52, wherein the myelin protein is myelin basic protein (MBP).

54. (previously presented): The composition of claim 51, further comprising a polynucleotide encoding an insulin protein.

55. (previously presented): The composition of claim 54, wherein the insulin protein is selected from the group consisting of insulin, proinsulin and preproinsulin.

56. (previously presented): A method of producing a modified nucleic acid vector with reduced immunostimulatory properties, the method comprising the steps of:

a) providing an unmodified nucleic acid vector comprising a CpG dinucleotide, wherein the CpG dinucleotide is in a motif of a formula 5' purine-pyrimidine-C-G-pyrimidine-pyrimidine-3';

b) substituting the cytosine in the CpG dinucleotide to a non-cytosine in the motif in the unmodified vector; thereby producing a modified nucleic acid vector, wherein the modified nucleic acid vector induces a reduced degree of immunostimulation in comparison to the unmodified nucleic acid vector.

57. (previously presented): The method of claim 56, wherein the cytosine to non-cytosine substitution is cytosine to guanine.

58. (previously presented): The method of claim 56, wherein a plurality of cytosine to non-cytosine substitutions are made.

59. (previously presented): The method of claim 58, wherein the plurality of cytosine to non-cytosine substitutions are made outside of a control region of the modified vector.

60. (previously presented): The method of claim 56, wherein the modified vector is a plasmid or cosmid vector.

61. (previously presented): The method of claim 56, wherein the composition further comprises an IIS comprising a hexamer region of a formula selected from the group consisting of 5'-Purine-Purine-[X]-[Y]-Pyrimidine-Pyrimidine-3' and 5'-Purine-Pyrimidine-[X]-[Y]-Pyrimidine-Pyrimidine-3'; wherein X and Y are any naturally occurring or synthetic nucleotides except that X and Y cannot be cytosine-guanine.

62. (previously presented): The composition of claim 61, wherein the nucleic acid vector further comprises the IIS.

63. (previously presented): The method of claim 61, wherein the IIS further comprises a polyG region linked 5' or 3' to the hexamer region.

64. (previously presented): The method of claim 61, wherein the IIS further comprises a first polyG region linked 5' to the hexamer region and a second polyG region linked 3' to the hexamer region.

65. (previously presented): The method of claim 56, wherein the unmodified vector is SEQ ID NO:297.

66. (previously presented): The method of claim 65, wherein the unmodified vector that is SEQ ID NO:297 is modified to comprise the following cytosine to non-cytosine substitutions:

C to G at nucleotides 784, 1161, 1218 and 1966;

C to A at nucleotides 1264, 1337, 1829, 1874, 1940, and 1997; and

C to T at nucleotides 1963 and 1987.

67. (previously presented): The method of claim 66, wherein the unmodified vector that is SEQ ID NO:297 is further modified to comprise the following cytosine to non-cytosine substitutions: C to G at nucleotides 1831, 1876, 1942, and 1999.

68. (previously presented): The method of claim 56, further comprising a pharmaceutically acceptable carrier.

69. (previously presented): The method of claim 56, wherein the modified vector further comprises a polynucleotide encoding an autoantigen targeted in an autoimmune disease.

70. (previously presented): The method of claim 69, further comprising a polynucleotide encoding a myelin protein.

71. (previously presented): The method of claim 70, wherein the myelin protein is myelin basic protein (MBP).

72. (previously presented): The method of claim 69, further comprising a polynucleotide encoding an insulin protein.

73. (previously presented): The method of claim 72, wherein the insulin protein is selected from the group consisting of insulin, proinsulin and preproinsulin.

74. (new): A nucleic acid vector backbone having a sequence at least 95% identical to the full-length of a sequence of SEQ ID NO:297, wherein the vector comprises at least one cytosine to non-cytosine substitution within a CpG dinucleotide, wherein the CpG dinucleotide is in a motif of a formula 5' purine-pyrimidine-C-G-pyrimidine-pyrimidine-3'.

75. (new): The nucleic acid vector backbone of claim 74, having a sequence at least 99% identical to the full-length of SEQ ID NO:297.

76. (new): The nucleic acid vector backbone of claim 74, wherein the cytosine to non-cytosine substitution is cytosine to guanine.

77. (new): The nucleic acid vector backbone of claim 74, wherein the nucleic acid vector comprises:

G at nucleotides 784, 1161, 1218, and 1966;

A at nucleotides 1264, 1337, 1829, 1874, 1940 and 1997; and

T at nucleotides 1963 and 1987.

78. (new): The nucleic acid vector backbone of claim 74, wherein the nucleic acid vector further comprises G at nucleotides 1831, 1876, 1942, and 1999.

79. (new): A nucleic acid vector comprising the nucleic acid vector backbone of claim 74, wherein the vector further comprises a polynucleotide encoding an autoantigen targeted in an autoimmune disease.

80. (new): The nucleic acid vector backbone of claim 79, wherein the autoantigen comprises a polynucleotide encoding a myelin protein.

81. (new): The nucleic acid vector backbone of claim 80, wherein the myelin protein is myelin basic protein (MBP).

82. (new): The nucleic acid vector backbone of claim 79, wherein the autoantigen comprises a polynucleotide encoding an insulin protein.

83. (new): The nucleic acid vector backbone of claim 82, wherein the insulin protein is selected from the group consisting of insulin, proinsulin and preproinsulin.

84. (new): The nucleic acid vector backbone of claim 74, further comprising a pharmaceutically acceptable carrier.

85. (new): A nucleic acid vector comprising a nucleic acid sequence encoding myelin basic protein and a vector backbone comprising at least four GpG motifs of a formula 5'-pyrimidine-purine-G-G-pyrimidine-pyrimidine-3'.

86. (new): The nucleic acid vector of claim 85, wherein the vector backbone has a sequence at least 95% identical to the full-length of SEQ ID NO:297.

87. (new): The nucleic acid vector of claim 85, wherein the vector backbone has a sequence at least 99% identical to the full-length of SEQ ID NO:297.

88. (new): The nucleic acid vector of claim 86, wherein the vector backbone comprises G at nucleotides 784, 1161, 1218, and 1966.

89. (new): The nucleic acid vector of claim 88, wherein the vector backbone further comprises G at nucleotides 1831, 1876, 1942, and 1999.

90. (new): The nucleic acid vector of claim 85, further comprising a pharmaceutically acceptable carrier.